THE JOURNAL OF ECONOMIC HISTORY

VOLUME XXXI SEPTEMBER 1971 NUMBER 3

Food Surpluses and Deficits in the American Colonies, 1768-1772

SCHOLARS are gradually piecing together the puzzle of the economic development of the American colonies through quantitative studies designed to clarify and measure economic variables having theoretical relevance for the wider process of economic growth and development. Recently, researchers such as Jones,[1] Land,[2] Shepherd,[3] Walton,[4] and Thomas[5] have been helping others to build a base that one day may permit the writing of a comprehensive study of the process of early American economic development which may even include reliable estimates of economic growth and living standards. The data problems for the colonial period of American economic history are severe, and much of the research has tended to concentrate on the important role of international trade, where the extant data sources are capable of yielding rich lodes of quantitative information. Customs 16/1, en-

1 Alice Hanson Jones, "Wealth Estimates for the American Middle Colonies, 1774," *Economic Development and Cultural Change,* XVIII, No. 4, Part II (July 1970).

2 Aubrey C. Land, "Economic Base and Social Structure: The Northern Chesapeake in the Eighteenth Century," THE JOURNAL OF ECONOMIC HISTORY, XXV (Dec. 1965), pp. 639-54. Land, "Economic Behavior in a Planting Society: The Eighteenth Century Chesapeake," *Journal of Southern History,* XXXIII (Nov. 1967), pp. 469-85.

3 James F. Shepherd and Gary M. Walton, "Estimates of 'Invisible' Earnings in the Balance of Payments of the British North American Colonies, 1768-1772," THE JOURNAL OF ECONOMIC HISTORY, XXIX (June 1969), pp. 230-63. James F. Shepherd, "Commodity Exports From the British North American Colonies to Overseas Areas, 1768-1772: Magnitudes and Patterns of Trade," *Explorations in Economic History,* VIII (Fall, 1970), 5-76.

4 Gary M. Walton, "New Evidence on Colonial Commerce," THE JOURNAL OF ECONOMIC HISTORY, XXVIII (Sept. 1968), pp. 363-89. Shepherd and Walton, "Estimates of 'Invisible' Earnings in the Balance of Payments," pp. 230-63.

5 Robert Paul Thomas, "A Quantitative Approach to the Study of the Effects of British Imperial Policy Upon Colonial Welfare," THE JOURNAL OF ECONOMIC HISTORY, XXV (Dec. 1965), pp. 615-38.

titled the *Ledger of Imports and Exports for America, 1768-1772,* has been the most valuable source of trade data, since it is the only comprehensive document which shows the trade of the American colonies with all parts of the world and not just with the British Isles.[6] Still yet to be mined are the rich sources of data buried in the naval office lists for the various colonies.[7] These sources also give the trade of each colony with all parts of the world although they are more tedious to work with than the better collated Customs 16/1.

One of their principal assets is that the naval office lists show global trade for periods of time prior to 1768-1772, yet many years are missing or rendered worthless through incomplete entries by the naval officers who were charged with the task of record keeping in the various ports. The present study also relies on Customs 16/1 and on the Massachusetts naval office lists to focus attention on an important aspect of the colonial domestic economy: the magnitude, geographic distribution, and the size relative to consumption requirements of basic food surpluses and deficits in the American colonies. The study concludes with a range of per capita income estimates.

A comprehensive study by James F. Shepherd has shown that the category of bread and flour exports was the second most valuable export commodity for the thirteen colonies in 1768-1772.[8] Bread and flour exports comprised approximately 14 percent of the total value of all commodity exports in those years. In addition, they probably were the fastest growing of the major commodity exports, rising about 69 percent in terms of quantity shipped between 1768 and 1772. That the colonists were able to produce significant food surpluses despite the consumption demands of a rapidly growing population is one reason for believing, as most economic historians do, that substantial extensive growth was taking place. The question of intensive growth, meaning a growth in product per capita, is still an unsolved mystery though at least one researcher has educed

[6] Public Record Office, London, Customs 16/1.

[7] Under the head of Board of Trade Papers in the Colonial Office Catalog, Public Record Office, London, the Naval Office Lists cover the trade of the following colonies for the years given: Carolina, 1716-1719, 1721-1735, 1736-1767; Georgia, 1752-1767; Maryland, 1689-1702, 1751-1765; Massachusetts, 1752-1765; New England, 1686-1717; New Hampshire, 1723-1769; New Jersey, 1722-1764; New York, 1713-1765; Virginia, 1697-1706, 1725-1769.

[8] Shepherd, "Community Exports," p. 65.

fragmentary evidence which suggests that the eighteenth-century colonial Americans were experiencing improved living standards.[9] Many more narrow quantitative studies will have to be done before the question of intensive growth becomes amenable to empirical verification. The question of food supplies in the colonies is certainly an important one, for unless the colonists could feed their growing population at constant or rising per capita levels, the living standard of the population would have declined. The need for mass importation of foodstuffs in the early period of American economic development would probably have hindered both population growth and the increased specialization that marked the different paths of development followed by the various colonial regions. This study seeks to measure the agricultural self-sufficiency of the colonial economy in 1768-1772 and gives special attention to the interregional coastwise trade in certain basic foodstuffs—a trade which played a vital role in eliminating the shortages which existed in the New England colonies.

I

This research builds on the dissertation of Max George Schumacher who used Customs 16/1 to tabulate the net exports of particular foodstuffs by each colony.[10] Net exports refers to the excess of exports over any imports; negative net exports means that imports of that commodity exceeded any exports. If one assumes that any food surplus produced within a colony was marketed outside of the colony by water transport, that is, via coastwise or overseas shipping, then the actual surplus of foodstuffs can be approximated by the net export figure. Since land transportation at this time was both difficult and costly, it seems reasonably safe to assume that most of the marketed surpluses would have been carried by ship. Unrecorded intercolonial trade down rivers and over short stretches of land between colonies undoubtedly occurred. In addition, some of the actual surpluses probably were unable to reach markets economically due to their remoteness from the seacoast or suitable forms of river transportation to the sea. For these reasons

[9] George Rogers Taylor, "American Economic Growth Before 1840: An Exploratory Essay," THE JOURNAL OF ECONOMIC HISTORY, XXIV (Dec. 1964), pp. 427-44.

[10] Max George Schumacher, "The Northern Farmer and his Markets During the Late Colonial Period," (unpublished Ph.D. dissertation, University of California, 1948).

one should view the net export figure as a lower bound measure of the actual surpluses involved.

Schumacher was primarily concerned with examining the northern farmer's overseas markets and not with considering the deficit or surplus problem as such. Therefore he did not convert the individual commodity figures into values which could be added together for valuing total food surpluses and deficits. Similarly, he was not directly concerned with the size of the aggregate colonial food surpluses or deficits relative to consumption requirements.

A rich legacy of earlier economic historians working on the colonial period is the price information which they have made available. The studies comprising Arthur H. Cole's *Wholesale Commodity Prices in the United States, 1700-1861* were the basis for the conversion of the quantity figures into common units of value.[11] The monthly commodity prices were converted to a simple annual average and then to a weighted five-year price for 1768-1772.[12] In order to convert these current colony prices into a common sterling equivalent, the Boston, New York, Philadelphia, and Charleston prices were deflated by .75, .5625, .60, and .14, respectively.[13] The basis for this deflation into sterling was the rate at which the local currency could be exchanged for sterling. Thus all values in this paper are given in pounds sterling.

The specific commodities selected for valuing the food surpluses and deficits were bread, flour, wheat, corn, beef, and pork. It seems likely that grain and meat products constituted the fundamental source of nourishment for the average colonist throughout the American colonies. This is not to say that foods such as wild game, fish, rice, vegetables, cheese, and fruits were unimportant. It is probably true, however, that the average person derived a relatively small part of his diet from such foods in comparison to grain products, beef, and pork. Therefore this study is concerned with a subset of all foods that were available to the consumer. Any regional variation in diet that existed is also left out of account. Hereafter the bread, flour, wheat, corn, beef, and pork surplus or deficit is referred to as the *basic* surplus or deficit.

[11] Arthur H. Cole, *Wholesale Commodity Prices in the United States, 1700-1861* (Cambridge: Harvard University Press, 1938), Statistical Supplement, pp. 57-64.

[12] As monthly commodity data were not available, the calculation of a weighted annual average price was not possible.

[13] Cole, Statistical Supplement, p. ix.

II

The average annual value of the grain and meat surpluses or deficits for each colony and commodity in 1768-1772 is given in Table 1. The table is in the familiar matrix form with the bottom row providing information on the value of the total average annual surplus for each commodity. The final basic surplus or deficit position of each colony is given in the last column of the table. The figures in brackets are deficit values.

Several interesting results emerge. Bread and flour, comprising approximately 63 percent of the basic surplus of £686,643, was by far the most important food surplus of the American colonies. By comparison, the Indian corn and beef and pork surpluses appear relatively small. It is evident that the colonists were processing the vast bulk of their wheat exports into flour, a procedure which would enhance the value and reduce freight costs. The extent to which grain, especially corn, was converted to meat is not known, although the feeding of grain to livestock may have been relatively unimportant in these times. Pennsylvania stands out as the leading surplus colony with nearly 48 percent of the aggregate basic surplus. By comparison, New York is much smaller and actually ranks behind Virginia and not much ahead of Maryland. The role played by grain in the tobacco colonies has tended to be overlooked in the literature.[14] All of the southern and middle colonies were surplus areas, but New England (excluding Connecticut) was a significant deficit region. Massachusetts, in particular, was consuming nearly £85,000 annually, and all of this was being imported from the other American colonies. Connecticut was the largest exporter of barreled meat and was also the largest exporter of livestock, for example, 4,375 horses, 2,582 cattle, and 7,105 head of sheep and hogs annually during 1768-1772.[15] No other American colony even came close to that performance. Most of the meat and livestock were shipped to the West Indies. Unless some of the animals were driven overland to markets in Rhode Island or Massachusetts, none apparently were sent to New England. Virginia was easily the leading surplus area for corn and was trailed distantly by Maryland and North Carolina. The upper South was also the leading exporter of loose wheat, with

[14] David Klingaman, "The Significance of Grain in the Development of the Tobacco Colonies," THE JOURNAL OF ECONOMIC HISTORY, XXIX (June 1969), pp. 268-78.
[15] Schumacher, p. 158.

TABLE 1

AVERAGE ANNUAL VALUE OF BASIC FOOD SURPLUSES AND DEFICITS IN THE AMERICAN COLONIES, 1768-1772

(Pounds Sterling)

	Bread[a] *and Flour*	*Wheat*	*Corn*	*Beef*[b] *and Pork*	*Colony Totals*
Maine	[3,002][c]	[25]	[1,216]	[223]	[4,466]
N. H.	[4,730]	[495]	[3,281]	[414]	[8,920]
Mass.	[42,516]	[9,595]	[24,637]	[8,103]	[84,851]
R. I.	[8,078]	[1,411]	[3,122]	283	[12,328]
Conn.	4,058	4,181	3,124	21,264	32,627
N. Y.	100,984	8,435	6,189	9,771	125,379
N. J.	2,366	[156]	406	[16]	2,600
Penn.	295,392	11,872	8,951	11,405	327,620
Del.	14,544	[23]	564	106	15,191
Md.	53,856	44,876	20,392	[165]	118,959
Va.	28,824	44,515	56,420	9,365	139,124
N. C.	1,010	1,202	14,439	11,610	28,261
S. C.	[4,058]	0	4,563	6,197	6,702
Ga.	[2,224]	0	1,276	1,693	745
Commodity Totals	436,426	103,376	84,068	62,773	686,643

Note: Boston prices were used in the calculations for Maine, New Hampshire, Massachusetts, and Rhode Island: 13.03 shillings per hundredweight of flour; 4.26 shillings per bushel of wheat; 2.63 shillings per bushel of corn; 42.92 shillings per barrel of beef or pork. New York prices were used in the calculations for Connecticut and New York: 10.79 shillings per hundredweight of flour; 3.51 shillings per bushel of wheat; 2.17 shillings per bushel of corn; 38.62 shillings per barrel of beef or pork. Philadelphia prices were used for New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina: 10.2 shillings per hundredweight of flour; 3.51 shillings per bushel of wheat; 1.94 shillings per bushel of corn; 39.85 shillings per barrel of beef or pork. Charleston prices were used for South Carolina and Georgia: 11.4 shillings per hundredweight of flour; 2.06 shillings per bushel of corn; 35.05 shillings per barrel of beef or pork. All prices are deflated to British pounds sterling.

[a] Customs 16/1 includes bread and flour in a single category. Flour probably made up a large proportion of bread and flour exports. See Arthur L. Jensen, *The Maritime Commerce of Colonial Philadelphia* (Madison, Wisconsin: The State Historical Society of Wisconsin, 1963), pp. 45-46, 60. Some kinds of bread were slightly cheaper than flour, but others were more expensive. In the table above, tons of bread and flour were valued as flour. The available quantity information does not differentiate among grades of flour.

[b] Customs 16/1 does not clearly distinguish between barrels of pork and beef. This makes pricing difficult since pork was considerably more valuable than was beef. It was assumed that half the imports and exports were beef, and the price used was the average of the beef and pork prices.

[c] The figures in brackets are deficits.

Sources: Max George Schumacher, "The Northern Farmer and His Markets During the Late Colonial Period," (unpublished Ph.D. dissertation, Department of History, University of California, 1948). Arthur H. Cole, *Wholesale Commodity Prices in the United States, 1700-1861* (Cambridge, Mass.: Harvard University Press, 1938).

Maryland and Virginia each exporting over £44,000 annually. Even bread and flour exports by the upper South were by no means trivial although here Pennsylvania and New York were the leading processors of wheat, the bulk of which was sold in southern Europe and the Wine Islands. When the important commodities of rice and fish are disregarded, the market value of the aggregate basic foods surplus was almost as great as the annual tobacco exports during 1768-1772, £686,000 compared to £766,000. If fish and rice are added to the basic surplus, the total average annual value comes to more than one million pounds sterling.[16]

III

So far we have been talking about the absolute size of the basic surplus and deficit for each colony, but if one is to gauge agricultural self-sufficiency, some reference will have to be made to food consumption. This is at best a crude process since actual consumption data for this period are lacking. Consumption estimates are necessary because a colony could have a relatively large absolute basic surplus and still be a trivial surplus colony in per capita terms if its population were also relatively large. Thus it becomes essential to attempt to estimate the per capita consumption requirements of the commodities forming the basic surplus. Adult consumption requirements were estimated at 2 hundredweight of flour, 11 bushels of corn, and 150 pounds of beef and pork (75 lbs. of each).[17] Children under the age of 16, who probably comprised

[16] See Shepherd and Walton, p. 258.

[17] The per capita flour consumption figure is near that used by Towne and Rasmussen for the 1800-30 period in their study of gross farm product in the nineteenth century. *Trends in the American Economy in the Nineteenth Century*, Studies in Income and Wealth, NBER, XXIV (Princeton: Princeton University Press, 1960), 294. They estimate 4.3 bushels of wheat per capita. Two cwt. of flour (224 lbs.) would convert to about 4.9 bushels of wheat per capita. This is based on 4½ bushels of wheat being equivalent to 196 pounds of flour. Percy W. Bidwell and John I. Falconer, *History of Agriculture in the Northern United States, 1620-1860* (New York: Peter Smith), p. 498. Applying estimates of per capita corn consumption to the colonial period is even more hazardous. Towne and Rasmussen estimate human per capita corn consumption in 1800-1840 at 4.4 bushels yearly. See p. 297 of their article. In 1839 average per capita consumption of corn by both humans and animals was approximately 22 bushels. See *Exports Domestic and Foreign, 1697 to 1789 Inclusive*, 48th Cong., 1st sess., House Misc. Doc. 49, Part 2 (Washington, D. C., 1884), p. 21; U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1957* (Washington, D. C., 1960), p. 297. It has also been estimated that slaves in Virginia not fed animal food consumed 15 bushels of corn annually. Kate Mason Rowland, "Merchants and Mills," *William and Mary Quarterly*,

about half of the population,[18] were allocated half of the adult requirements.[19] These basic annual per head consumption requirements had an average annual market value in Philadelphia wholesale prices of about £2.625 during 1768-1772.[20] There is, of course,

1st Ser., XI (Jan. 1903), 245-46. It seems unlikely that the practice of feeding corn to animals was as important in 1768-72 as it was in the first half of the nineteenth century when the ratio of total corn consumption to human corn consumption was roughly 5:1. If this ratio were only one-half as large in 1768-72, total per capita corn consumption could have been 11 bushels annually. This figure would be too low if human corn consumption were greater in 1768-72 than in the later period. Corn was an important food crop in the colonial period, especially in the South among the numerous small planters and slaves.

With respect to beef and pork, Robert E. Gallman adjusted the Towne and Rasmusson figures of per capita production of pork, beef, and veal and concluded that it was about 230 pounds in 1860. This means that per capita consumption must have been less than 230 pounds per capita. Robert E. Gallman, "Self-Sufficiency in the Cotton Economy of the Antebellum South," *Agricultural History*, XLIV (Jan. 1970), 18. Kohlmeier assumed that in 1850 in southern Illinois and Indiana the per capita consumption of hogs was one per person. A. L. Kohlmeier, *The Old Northwest* (Bloomington, Ind.: The Principia Press, Inc., 1938), p. 95. The slaughter weight of hogs was probably about 140 to 150 pounds at this time. See Gallman, "Self-Sufficiency in the Cotton Economy," pp. 14-15. James T. Lemon estimated that in the agricultural area of southeastern Pennsylvania in 1740-90 the per capita beef and pork consumption was 150 pounds. James T. Lemon, "Household Consumption in Eighteenth-Century America and Its Relationship to Production and Trade: The Situation Among Farmers In Southeastern Pennsylvania," *Agricultural History*, XLI (Jan. 1967), 61. If the per capita beef and pork consumption were 224 pounds instead of the assumed 150 pounds, the aggregate colony percentage basic surplus would be 10.8 percent instead of 12.3 percent. The percentage basic surpluses and deficits are not very sensitive to errors in the estimated per capita quantities of the basic consumption requirements of grains and meat. They are, however, sensitive to errors in the per capita value of the basic surplus or deficit. Yet these are based on the net export, population, and the price data employed—all of which are probably as reliable as can be obtained. Manifestly, the per capita grain and meat consumption figures employed are at best a crude approximation to the correct ones. For estimates of colonial food consumption requirements which may be somewhat higher than those employed in this study, the reader should see Table Z, pp. 388-405 in *Historical Statistics*. Unfinished research by Lawrence A. Harper and Mrs. Marga Stone should eventually produce more accurate estimates of early American dietary standards.

[18] The *First Census of the United States* has the white male population under 16 years of age as about 25 percent of the total population in 1790. See p. 8. If there were as many females as males and assuming the slave age distribution was the same as the white population, this would put half the population under 16 years of age.

[19] Presumably older children consumed at a higher rate than half the adult ration whereas the more numerous younger children ate less than half the adult requirements. This procedure is employed by Gallman, "Self-Sufficiency in the Cotton Economy," p. 18. Gallman assigned half the meat ration for field hands to slaves under 15.

[20] The figure of £2.625 was obtained as follows: 2 cwt. of flour at 20.4 shillings plus 11 bushels of corn at 21.34 shillings plus 150 lbs. of beef and pork at 26.7 shillings totals to 68.44 shillings or £3.42. Round this to £3½ to obtain the adult requirement value. This reduces to £2.625 when children are accounted for as consumers at one-half the adult rate.

a serious theoretical problem in valuing food consumption at the market price at which the commodities were sold. The fact is that much of the food crop was consumed on the farm and not sold. At the margin, if the alternative to consuming food was to sell it, then perhaps the foregone alternative value of the food consumed (the market price) is an approximation of the value of the food to those who consumed it.

The last column of Table 1 was divided by the corresponding colony population for 1770 to obtain the per capita value of the basic surplus or deficit for each colony. These results were then divided by £2.625 in order to obtain a crude estimate of the relative size of the surplus or deficit in comparison to consumption requirements.[21] These final results are the percentages given in Table 2; they represent the basic colony surplus or deficit as a proportion of total estimated consumption requirements for the colony.

For the colonies as a whole, it was estimated that the basic food surplus of £686,000 constituted approximately 12 percent of aggregate consumption requirements. This is clearly a sizeable surplus although perhaps less than one might have expected based on a casual scrutiny of the absolute value of the surpluses involved. If per capita incomes were stagnant during this period, it was not due to inability to produce beyond food consumption requirements. It would be interesting to know what the relative magnitude of the basic surplus was several decades earlier. If it were rising, it would be a modicum of support for the Taylor thesis that living standards were rising during the 65 years preceding the Revolution.[22] Using the naval lists, it would probably be feasible to calculate this for particular colonies.

On a colony and regional basis, Table 2 shows that the distribution of the percentage surpluses was quite uneven. As one would expect, the middle colonies (including Connecticut) led the way

[21] The fact that wholesale prices are used in calculating the £2.625 figure is not a source of error, since the surplus and deficit value (the numerator) is also in wholesale prices. However, the use of Philadelphia prices in employing the £2.625 figure for all regions of the colonies is a source of error since the surplus and deficit values are in regional prices. Alternative calculations show that this procedure does not affect the results by much. The main impact is to lower the percentage value of the New England deficit by approximately 15 percent.

[22] Taylor, "American Economic Growth Before 1840," p. 437. This scholar has speculated that between 1710 and 1775 the average annual rate of increase of real per capita income in the American colonies was slightly more than 1 percent per annum.

TABLE 2
AVERAGE ANNUAL PER CAPITA DEFICITS OR SURPLUSES OF WHEAT, CORN, BEEF, AND PORK AS A PERCENTAGE OF ESTIMATED CONSUMPTION REQUIREMENTS BY COLONY, 1768-1772

Region / *Colony*	*Deficit*[a] *or Surplus*
New England	[10.9]
Maine	[5.4]
New Hampshire	[5.4]
Massachusetts	[13.8]
Rhode Island	[8.1]
Middle Colonies	25.9
Connecticut	6.7
New York	29.3
New Jersey	0.8
Pennsylvania	52.0
Delaware	16.3
Upper South	15.1
Maryland	22.4
Virginia	11.8
Lower South	4.0
North Carolina	5.4
South Carolina	2.1
Georgia	1.2
Colonies	12.3

Note: Adult consumption requirements were estimated as 2 cwt. of flour, 11 bushels of corn, and 150 pounds of beef or pork. Children under 16 (an estimated one half of the population), were allotted one half the adult ration. In Philadelphia wholesale prices, the per capita value was approximately £2.625 per annum.

[a] Figures in brackets are deficits.

Source: See Table 1. The colony population figures used in the calculations are for 1770 from U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1957* (Washington, D. C.: G.P.O., 1960), p. 756.

with a basic surplus equal to nearly 26 percent of estimated basic consumption requirements. The percentage surplus in the upper South was substantial although less than three-fifths that of the middle colonies. The lower South had a relatively small percentage surplus, especially if North Carolina is excluded. It should be remembered, however, that rice is not included as part of the basic surplus, just as fish is omitted from consideration of the New England deficit. These regional dietary variations would make a difference in the actual regional food surplus or deficit. In New England the deficit as a percentage of the estimated requirements of grain and meat was approximately 11 percent although meat is relatively unimportant in the composition of the deficit. Massachusetts had a much higher

basic deficit than did the rest of New England in both absolute and percentage terms. The food deficit in New England deserves some attention because it played an integral part in the burgeoning growth of the intercolonial trade and because the imports of foodstuffs were essential to the continued growth and development of the New England coastal towns.

IV

Most of the people in New England were self-sufficient pioneer farmers, but apparently the relatively rocky soil and the harsh climate were not conducive to the emergence of grain surpluses sufficient to sustain the growing population of the port towns. It may also be true that the cultivation of wheat in New England was curtailed after 1670 due to the persistence of the rust disease.[23] New England had probably been a net importer of foodstuffs since early in the eighteenth century and by the 1760's was dependent on external supply sources for her marginal requirements in corn, wheat, and meat. Data gleaned from the Massachusetts naval lists can be used to illuminate this intercolonial trade in foodstuffs. Unlike Customs 16/1, the naval lists make it possible to identify the specific sources of supply relied upon since they give the origin of all ships entering the colony. In addition, because the naval lists cover a broad period of time, it is feasible to approximate the growth of this food import trade over time. It may not be appropriate to generalize the results for Massachusetts to all of New England. Nevertheless, the average annual value of the basic New England food deficit was about £110,500 in 1768-1772, and over 75 percent of this basic deficit was attributable to Massachusetts.[24]

The average annual value of the coastwise import and export trade of Massachusetts amounted to at least £136,000 sterling in 1761-1765. More than 70 percent of this value consisted of imports, and approximately 85 percent of the total import value consisted of foodstuffs. The major coastwise exports in order of importance were rum, sugar, molasses, fish, and salt.[25]

[23] Albert Bushnell Hart, *Commonwealth History of Massachusetts*, II (New York: The State History Co., 1928), p. 391.

[24] See Table 1.

[25] David C. Klingaman, "The Coastwise Trade of Colonial Massachusetts," Research Paper No. 51, Dept. of Economics, Ohio University. The study is based primarily on the Massachusetts Naval Office lists, which end in the year 1765.

TABLE 3
BASIC FOOD IMPORTS BY MASSACHUSETTS
1714-1717 and 1761-1765

Years	Grain[a] (bushels)	Flour[b] (barrels)	Beef and Pork (barrels)
Average Annual Imports, 1714-1717	2,100	102	142
Average Annual Imports, 1761-1765[c]	250,000	38,000	3,200

[a] The data source does not differentiate among the different kinds of grains which were mostly corn and wheat with a small amount of oats. In 1768-1772 about 80 percent of the bushels of corn and wheat imported consisted of corn. Rice is not included in this category (an annual average of 3,500 casks in 1761-1765 and none in 1714-1717).

[b] The flour imports include some bread valued as flour.

[c] These figures are rounded to the nearest thousands or hundreds.

Source: Massachusetts Naval Office Lists, Public Record Office, London, C.O. 5/848, C.O. 5/850, and C.O. 5/851.

The average annual imports of grain, flour, beef, and pork are given in Table 3 for the years 1714-1717 and 1761-1765. In the early period, the food imports were quite small, indicating that the colony was supplying most of its own needs. By the 1761-1765 period, food imports had increased enormously in every item although the growth may be somewhat overstated. Some of the ships which entered in the early period may have gone unrecorded by the naval officers, and it is known that a few of the ships contained cargoes which were not recorded by the naval officers in a manner which permitted quantification. This marked growth in imports of basic food supplies reflects the growing population in the coastal towns which needed larger quantities of foodstuffs but probably also reflects a change in the structure of employment in and around those towns. The seaboard inhabitants were becoming increasingly specialized in non-agricultural occupations. This rapid growth in the interregional trade between New England and the other colonies was significant because it enlarged the size of the market and facilitated the development of regional specialization which was already shaped by the overseas exchange of goods and services.

The identity of the colonies that supplied the Massachusetts market is given in Table 4. The relative importance of each colony in supplying a particular commodity is given by the percentages in that table. The upper South emerges as the principal supplier of corn and wheat, Pennsylvania as the dominant flour supplier, and North

TABLE 4
PERCENTAGES OF BASIC MASSACHUSETTS FOOD IMPORTS FROM EACH COLONY, 1761-1765

Colony	*Grain*	*Flour*	*Beef and Pork*
South Carolina	1.4	0.0	18.4
North Carolina	16.5	0.0	55.1
Virginia	32.5	0.1	11.7
Maryland	46.4	4.5	6.1
Pennsylvania	3.0	92.3	6.8
New York	0.2	3.1	1.2
Georgia	0.0	0.0	0.7

Source: Public Record Office, C.O. 5/850 and C.O. 5/851.

Carolina as the most important meat supplier. It is interesting that New York was only a trivial supplier to the Massachusetts market. A casual inspection of the New York naval lists for 1763 and 1764 indicates that New York had a comparatively small coastwise trade business at this time. On the import side, rice from South Carolina predominated. Exports were diverse, were greater than imports, and centered around the sale of provisions. As New York had a large food surplus, it is not clear why so little was sent to the relatively near market in New England. The amount of trade between Massachusetts and North Carolina is also puzzling, since nearer supplies of meat were available in the middle colonies and in the upper South. Massachusetts was also importing substantial quantities of naval stores from North Carolina. Approximately 95 percent of the coastwise tar and turpentine imports and 75 percent of the coastwise pitch imports came from North Carolina. Thus it may have been economical for the merchants and ship captains to combine cargoes of meat and naval stores for trade between the two regions. But why did they not see fit to combine meat imports with the Philadelphia flour imports or meat imports with the upper South grain imports? Virginia, Maryland, and Pennsylvania were all large shippers of meat to the West Indies; yet these colonies claimed only approximately 25 percent of the Massachusetts market. Perhaps the quality of the North Carolina pork was more preferred by the New Englanders. This could also explain why Philadelphia flour was such an overwhelming choice of the New Englanders even though the upper South and New York had the capacity to satisfy easily the New England demand for flour. The price data from Cole for 1761-1765 may furnish a more satisfying motive for buying meat in the Carolinas and flour in Philadelphia.

Although North Carolina beef and pork prices are not available, the Charleston price of beef and pork was substantially lower than either the New York or Philadelphia price. Philadelphia flour prices were also slightly lower than those in New York;[26] we have no reliable prices for foodstuffs in the upper South. One suspects that the actual reasons for such trade patterns were more complex than those suggested above, and it illustrates how little we know about the flourishing intercolonial exchange of goods and services.

V

Economic historians have only a vague idea of what per capita income was during the colonial period.[27] The data base is simply insufficient to make a reasoned judgement concerning this matter. The question of income levels in colonial times is important historically because it concerns the economic welfare of over 2½ million persons on the eve of the Revolution. Political and social history is better understood when it is developed in the context of the level of material welfare experienced by the people who lived at the time. Perhaps the primary reason for the interest of economists in knowing the level of colonial per capita income is that it would establish an earlier benchmark for more comprehensive measurement of the long-run performance of the American economy. Information on colonial living standards would also be useful to development economists in appraising the relevance of the early American experience to the undeveloped countries of today. Given the need for this information and the improbability of ever estimating it directly through aggregation of production in certain sectors of the economy, researchers are probably justified in employing micro ap-

[26] These same relative price relationships also prevailed in the 1768-72 period although the price differentials in beef and pork between the lower South and the middle colonies appear to have narrowed appreciably. Any relative movement of colony exchange rates between 1761-65 and 1768-72 is not clear, hence the price comparisons among colonies is speculative.

[27] Several economists have conjectured about this question. Raymond W. Goldsmith, "Historical and Comparative Rates of Production, Productivity and Prices," Hearings before the Joint Economic Committee, 65th Cong., 1st Sess., Part 2, 1959, pp. 277-78. This is reprinted in Ralph Andreano, ed., *New Views on American Economic Development* (Cambridge: Schenkman Publishing Co., Inc., 1965). Also see p. 50 for Andreano's own remarks on the subject of growth rates. G. R. Taylor, "American Economic Growth Before 1840," pp. 427-37. Albert Fishlow, discussion of G. C. Bjork's article, THE JOURNAL OF ECONOMIC HISTORY, XXIV (Dec. 1964), 566.

proaches to income estimates for this period. This final section of the article is devoted to a crude approximation of what per capita income may have been, based on the value of food consumption requirements in the years 1768-1772.

It was estimated earlier that the average per head value of the basic consumption requirement in grain and meat was approximately £2.625 in Philadelphia wholesale prices in the years 1768-1772. In order to lessen any doubt that this estimate is too low and to allow for regional price variations and retail mark-ups, assume that this figure is inflated by one-third to £3½ per capita. This amount represents the average per head value of grains and meats consumed but excludes other food items which were consumed. It seems unlikely that less than half the value of the average person's food budget was composed of grain and meat—it was probably a good deal more than half. But if it were half, it would mean that the total per capita food consumed was about £7. Now if one knew what proportion of the average colonist's income was represented by the value of food consumption, it would be possible to approximate his per capita income. At present there is no way of knowing these percentage figures for the colonial period, but it is possible to guess what they may have been by observing the corresponding figures that exist today in some undeveloped countries. The percentage of disposable income spent on foodstuffs was calculated for the following six countries for various years in the 1953-1964 period: Equador, Honduras, Jamaica, Jordan, Panama, and Korea. The simple average percentage expenditure on foodstuffs out of disposable income was roughly 45 percent. The range was from 53 percent in Jordan to 37 percent in Jamaica.[28] Recent meager data are also available on rural farm per capita household expenditures on food as a percentage of per capita national private consumption expenditures for several countries. The average was about 48 percent for the following countries: United States, Japan, France, Italy, Norway, and Yugoslavia. The range was from slightly over

[28] United Nations, *Yearbook of National Accounts Statistics, 1965* (New York: U. N., 1966), pp. 482-83. Part D, Table No. 6, contains personal and percentage disposable income data. Scattered through pp. 3-423 in Part C are the country food consumption figures. The years used for Korea, Ecuador, Jamaica, and Panama were 1953, 1958, 1960, and 1964. For Honduras the years used were 1953, 1958, 1960, and 1963. In the case of Jordan it was 1959, 1960, and 1963. The percentage of disposable income spent on food was obtained for each country by averaging the data for the years. Then a simple six-country average was calculated.

TABLE 5
HYPOTHETICAL ESTIMATES OF COLONIAL PER CAPITA INCOME, 1768-1772

Annual Value of Per Capita Meat and Grain Requirements[a]	*Annual Value of Per Capita Total Food Requirements*[b]	*Percent of Income Spent on Foodstuff*[c]	*Resultant Income Per Capita*[d]
£3 1/2	£4 1/2	70%	£6 1/2
3 1/2	5 1/2	60	9
3 1/2	6 1/2	50	13
3 1/2	7 1/2	40	19

[a] This is the £2.625 figure inflated by one-third to allow for any undervaluation or for a retail mark-up on the wholesale price.

[b] These figures are alternative per capita total food costs which include the £3 1/2 value of meat and grain consumed plus £1 to £4 more to allow for a broader diet that included other foodstuffs.

[c] These are alternative percentages of average per capita income applied toward consumption of all foods.

[d] The per capita income estimates were obtained by dividing the second column by the third column of the table. The figures are rounded to the nearest half pound sterling.

Sources: Consumption requirement estimates of meat and grain are those of footnote 17 valued in Philadelphia prices given in the note to Table 1. The proportions of income applied to food consumption are hypothetical, based on the discussion in the text and in footnotes 28 and 29.

55 percent for Central-North Italy to slightly below 37 percent for Norway.[29] It is surprising how comparable the two different sets of data are over both space and degree of development.

There is, of course, no way of knowing what the equivalent percentages were in colonial times. One is tempted to infer, however, that they were almost certainly between 40 and 70 percent. If the relevant percentage figures were 40 percent and assuming a total per capita food consumption value of £7, it would mean that per capita income was £17½. In Table 5 various combinations of data are used to set lower and upper bounds and two intermediate values for per capita income—the wide range is from £6½ per head to £19 per head. Food was relatively cheap in the colonies and the price data on consumables make the £7½ figure in the second column appear much too high. With respect to the £6½ per capita income figure in the last column, the 70 percent figure in the third column seems too high. Not a single developed or undeveloped

[29] United Nations, *Compendium of Social Statistics: 1967* (New York: U. N., 1968), pp. 245, 247. This gives data for American rural farm population in 1955, Japanese farm population in 1951-52, and French farm households in 1956. *Compendium of Social Statistics: 1963* (New York: U. N., 1963), pp. 201-02. This covers the Italian Central-North and South in 1953, Norway in 1954, and Yugoslavia in 1955.

country in the samples above had such a high percentage, even though the average per capita income in the first set of six undeveloped countries was not much above $200 per capita. In India, where per capita income is around $75 per head, working class families very seldom budget 70 percent of their total consumption expenditures for foodstuffs, and the average is probably below 60 percent.[30] Thus one is led to suspect that actual per capita income was more than £6½ and less than £19. How much more and how much less is an open question. Alice Hanson Jones has calculated a range of per capita income estimates for the American colonies. Inferring income from wealth estimates, she concluded that per head income was between £8.4 and £14.0 in 1774.[31] Manifestly, the congruity of her findings with those given above is striking.

It seems unnecessary to remind the reader that the results of this study are proffered as tentative approximations. This is particularly true of the last section concerning the per capita income estimates. It is hoped that other economic historians will check these unrefined income estimates through other micro-approaches which are more rigorous than the one employed here. If several such studies should lead to comparable results, it might be possible to resolve the question of colonial incomes to an acceptably reliable range of estimates. The problems involved in translating any such income estimates into current dollars that are meaningful for international and intertemporal comparisons are immense, but probably such an attempt should be made. The purpose of this paper was to measure approximately the agricultural self-sufficiency of the various colonial regions; the attempt to bracket per capita incomes was almost an incidental outcome.

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[30] Labor Bureau, *Indian Labor Statistics, 1968* (Delhi: Government of India Press, 1968), p. 148.

[31] Jones, p. 128, computed from Table 51.